

Abstract

Carrier Interferometry (CI) is a multicarrier signal-processing architecture that enhances diversity benefits and system capacity for any transmission protocol. CI causes redundantly modulated carriers to interfere in such a way that desired signals combine constructively whereas undesired signals cancel. CI simplifies transmitters and receivers by enabling slow parallel processing to replace fast serial processing. CI also enables direct digital conversion between radio frequencies and baseband frequencies. Since CI signal processing is similar to spatial processing, simple methods and systems are provided that combine the benefits of CI and spatial processing. Benefits of CI and spatial processing can be provided to wideband and ultra-wideband transmission protocols. Thus, a multiple-input, multiple-output communication system is easily constructed for any conventional transmission protocol when using CI as an underlying signal-processing architecture. A software-controlled CI digital radio system is adaptable to different transmission protocols, a wide range of transmission frequencies, and a variable propagation environment.